

IN THE CLAIMS

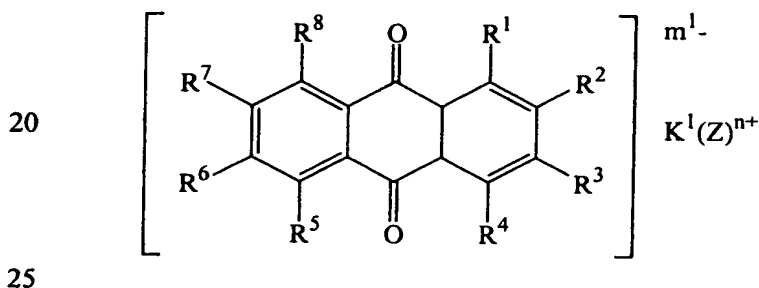
1. A thermoplastic resin composition for laser welding comprising:

- 5 1) thermoplastic resin; and
 2) laser-transmitting black colorant comprising amine salt of anthraquinone dye.

2. A thermoplastic resin composition for laser welding comprising:

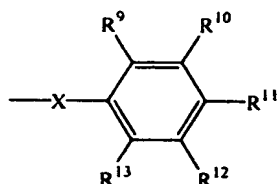
- 1) thermoplastic resin; and,
 10 2) laser-transmitting black colorant comprising amine salt of anthraquinone dyes of formula [I] or formula [II],

wherein Formula [I] is:



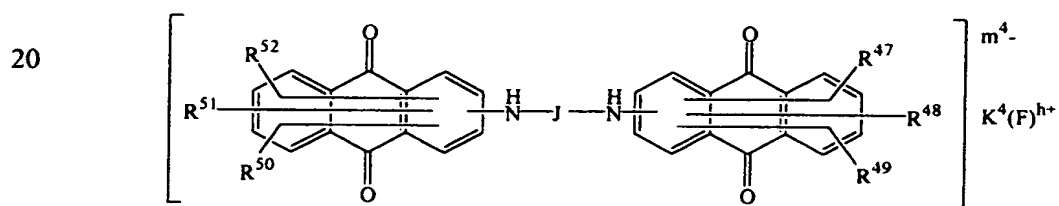
wherein R^1 to R^8 , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, cyclohexylamide, sulfonyl, formula [I-a], or -Y-W, and at least
 30 one of R^1 to R^8 is of formula [I-a]; wherein Y is S, O, or NH; wherein W is selected from unsubstituted or substituted alkyl group, alkenyl group, and unsubstituted or substituted aryl group; wherein $(\text{Z})^{n+}$ represents ammonium ion or a cation derived from an organic amine compounds or a basic dye; wherein n is 1 or 2, m^1 is an integer from 1 to 4 and K^1 is the ratio of m^1 / n ;

and wherein formula [I-a] is:



10 wherein X is O or NH, and R⁹ to R¹³, which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, or sulfonyl; wherein at least one of R¹ to R⁸ and R⁹ to R¹³ is sulfonyl group; and wherein

15 formula [II] is:



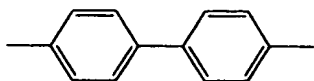
wherein R⁴⁷ to R⁵², which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, or sulfonyl; and at least one of R⁴⁷ to R⁵² is of sulfonyl; and

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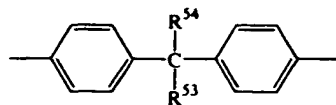
Formula J in formula [II] is selected from formula [II-a] or formula [II-b] and binds two anthraquinone,

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Wherein formula [II-a] is:



50 and formula [II-b] is:



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wherein R^{53} to R^{54} , which may be the same or different, are independently selected from the group consisting of alkyl(having 1 to 8 carbon atoms) or hydrogen ; and wherein $(F)^{h+}$ represents ammonium ion or a cation derived from an organic amino compounds or a basic dye wherein h is 1 or 2, m^4 is an integer from 1 to 4 and K^4 is the ratio of m^4/h .

15 3. The composition of claim 1 further comprising a second dye mixed with said amine salt of said anthraquinone dye to produce a laser-transmitting black dye.

20 4. The composition of claim 2 further comprising a second dye mixed with said amine salt of a said anthraquinone dye to produce a laser-transmitting black dye.

5. The composition of Claim 4, wherein said second dye is selected from the group consisting of perinone dyes, monoazo complex dyes, anthrapyridone dyes and anthraquinone dyes.

25 6. The composition of Claim 2 further comprising (i) a red dye to be mixed with said amine salt of said anthraquinone dye to produce a laser-transmitting black dye, said red dye selected from the group consisting of perinone dyes, monoazo complex dyes, and anthrapyridone dyes; and (ii) an additional yellow dye to be added to said mixture selected from the group consisting of monoazo complex dyes and anthraquinone dyes.

30 7. The composition of any one of claims 1-6 in which said thermoplastic resin is polyamide or polyester.

8. The composition of Claim 7, further comprising reinforcing agent.

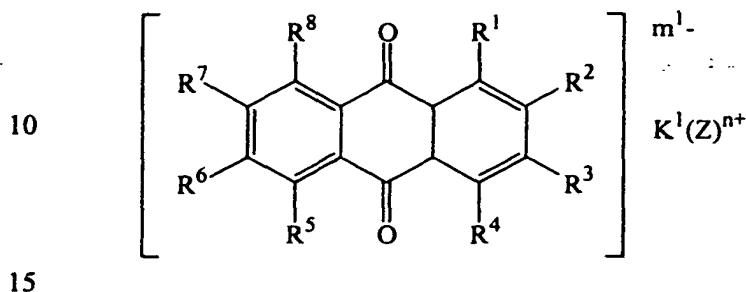
9. A laser-transparent article formed from the composition of any one of Claims 1-6.

35 10. An article formed by laser welding an opaque article with the laser-transparent article of Claim 9.

11. A laser-transmitting black colorant suitable for being mixed with a thermoplastic resin comprising at least amine salt of anthraquinone dyes.

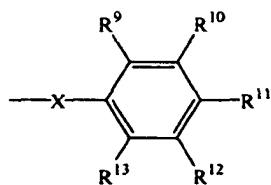
40 12. A laser-transmitting black colorant suitable for being mixed with a thermoplastic resin comprising amine salt of anthraquinone dyes of formula [I] or formula [II],

wherein Formula [I] is:



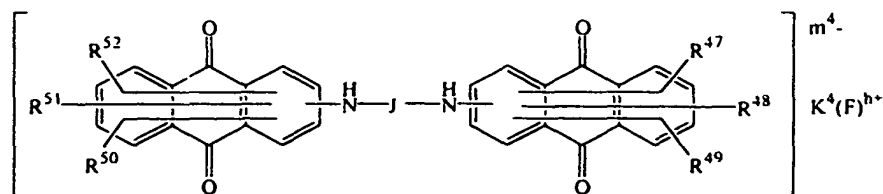
wherein R^1 to R^8 , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxy carbonyl, cyclohexylamide, sulfonyl, formula [I-a], or -Y-W, and at least one of R^1 to R^8 is of formula [I-a]; wherein Y is S, O, or NH; wherein W is selected from unsubstituted or substituted alkyl group, alkenyl group, and unsubstituted or substituted aryl group; wherein $(\text{Z})^{n+}$ represents ammonium ion or a cation derived from an organic amine compounds or a basic dye; wherein n is 1 or 2, m^1 is an integer from 1 to 4 and K^1 is the ratio of m^1 / n ;

25 and wherein formula [I-a] is:



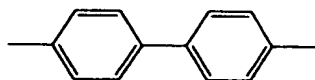
wherein X is O or NH, and R^9 to R^{13} , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxy carbonyl, or sulfonyl; wherein at least one of R^1 to R^8 and R^9 to R^{13} is sulfonyl group; and wherein formula is [II]:

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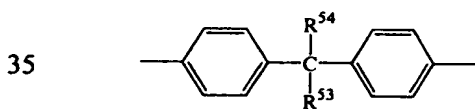
- 5 wherein R^{47} to R^{52} , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, or sulfonyl; and at least one of R^{47} to R^{52} is of sulfonyl; and
- 10 Formula J in formula [II] is selected from formula [II-a] or formula [II-b] and binds two anthraquinone,
Wherein the formula [II-a] is:

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and wherein the formula [II-b] is:



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- wherein R^{53} to R^{54} , which may be the same or different, are independently selected from the group consisting of alkyl(having 1 to 8 carbon atoms) or hydrogen ;
and wherein $(F)^{h+}$ represents ammonium ion or a cation derived from an organic amino compounds or a basic dye wherein h is 1 or 2, m^4 is an integer from 1 to 4
45 and K^4 is the ratio of m^4/h .

13 The composition of Claim 12, where in the laser-transmitting black colorant
suitable for being mixed with a thermoplastic resin comprising at least amine salt
of anthraquinone dyes of formula [I] where as at least one of R^9 , R^{10} , R^{11} , R^{12} and
5 R^{13} of formula [I-a] is sulfonyl group.

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